DOCUMENT 1/1

DOCUMENT NUMBER

@: unavailable

1. JP,2003-341033, A

BACK   NEXT

MENU   SEARCH

HELP

JAPANESE [JP,2003-341033, A]

CLAIMS DETAILED DESCRIPTION TECHNICAL FIELD PRIOR ART EFFECT OF THE INVENTION TECHNICAL PROBLEM MEANS OPERATION DESCRIPTION OF DRAWINGS DRAWINGS

[Translation done.]

* NOTICES *

JPO and INPIT are not responsible for any damages caused by the use of this translation.

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention]This invention relates to the ink-jet recording device which has especially a double-side printing function about the ink-jet recording device which records by breathing out ink according to a signal.
[0002]
[Description of the Prior Art]By driving the dot formation means of a recording head based on a record signal, recorders, such as a printer and a facsimile, are constituted so that the dot pattern corresponding to said signal (picture information) may be formed on the recording medium (usually record sheet).
[0003]Although there is a recorder using the inkjet method as one form of

Drawing selection Representative draw
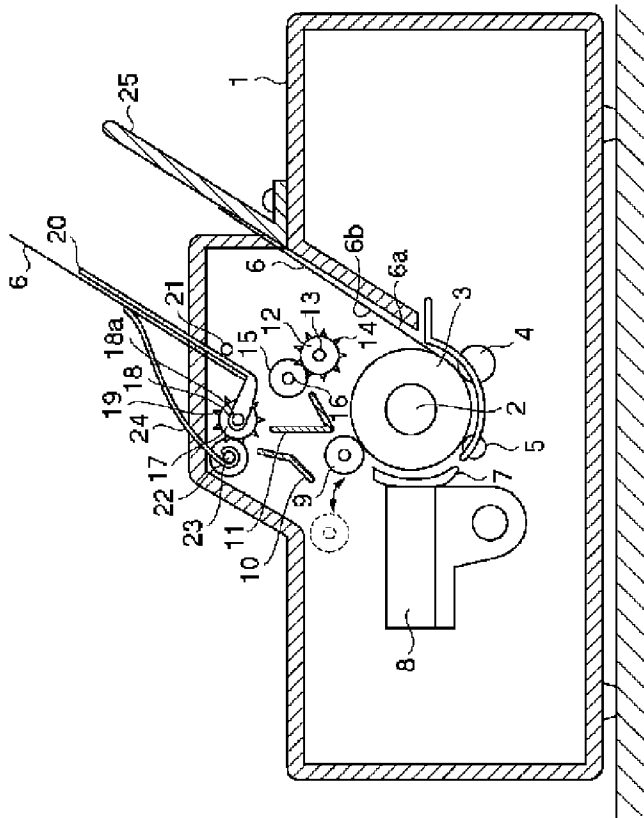
[Translation done.]

said recorder, this makes an ink droplet fly according to said signal from a recording head, makes said ink droplet adhere to recording media, such as a record sheet and plastic sheet metal, and forms a picture.

[0004]This inkjet method is adopted and what is called back projection [say / the picture on the rear face of a recording medium being transparent in a recording medium surface according to the kind of recording medium, etc. at the time of double-sided recording, and being reflected] may take place in the device which possesses a perfecting machine style further.In that case, there was a problem of the ink of a table and the reverse side having carried out mixed colors, and becoming difficult to read the recorded picture.

[0005]In the ink-jet recording device which has said double-sided recording function in order to solve this problem, In "the patent number No. 2879872", reference is made about that judging means which is one side record or is double-sided recording, and a means to choose the printing Duty based on the judging means by this judging means.

[0006]

[Problem(s) to be Solved by the Invention]However, in the judging means of ** "patent number No. 2879872", Since selection of the printing Duty is performed by only the judgment that it is double-side printing, The case where the surface high Duty section and the high Duty section on the back are located on the coordinates which separated on print media, and the mixed colors of ink cannot happen, First of all, since there was no printing portion of high Duty, also when back projection could not occur, there was a problem that the printing Duty will be low set up only by the precondition that it is double-side printing.

[0007]Since the element which is the target of this selecting means is also the printing Duty, For example, the user surely desires printing without the mixed colors of ink by high printing quality, there is a problem that the double-side printing of low Duty will

be chosen also when it is thought that single side printing may be sufficient for that purpose, and a user's operation was made complicated.

[0008]

[Means for Solving the Problem]In this invention in order to solve the above-mentioned problem, in an ink-jet recording device which has a perfecting machine style -- ink of a rear surface -- it is crowded among them and Duty adopts composition characterized by providing a means to judge whether it is excessive, and a means to choose automatically from two or more print modes a print mode which was most suitable for a situation to a printing object medium.

[0009](OPERATION) By the above composition, it can become possible to choose optimal print mode automatically for every object print data, performance of an ink-jet recording device with a perfecting machine style can be pulled out efficiently, and facilities can be given to a user.

[0010]

[Embodiment of the Invention]
(Example 1) The ink-jet recording device concerning the 1st example of this invention is explained with reference to drawings.

[0011]An approximate account is first carried out about the entire configuration of an ink-jet recording device. As composition of an ink-jet recording device with a perfecting machine style, A charting machine has only an object for one side, and what realizes a perfecting machine style, and the inversion mechanism of a recording medium have some which realize a perfecting machine style by providing the charting machine itself the object for the surfaces, and for [two] rear faces by having provided the mechanism in which a recording medium was reversed from a table to the reverse side, without having. When which gestalt is adopted, since it is effective, drawing 1 - 8 explain the former and this proposal explains the latter by drawing 9 - 10, and when any of two gestalten are adopted, it shall explain it by drawing 11 - 15 about

common composition.

[0012]Drawing 1 is a section composition explanatory view of the printer which is one example of the ink-jet recording device concerning this invention.

[0013]The platen 3 is supported by the printer body 1 via the platen shaft 2, enabling free rotation, and the feed rollers 4 and 5 of the couple are arranged at this platen 3 bottom, enabling free rotation. Said feed rollers 4 and 5 are always welded by pressure to the peripheral face of said platen 3, follow by rotation of the platen 3, and they are constituted so that the recording medium 6 may be conveyed to a determined direction.

[0014]To the front sides (left-hand side of drawing 1) of said platen 3, the 1st guide plate 7 sets the platen 3 and a prescribed interval, and is arranged at them. The career 8 is equipped with said 1st guide plate 7, and the unillustrated recording head is carried in this career 8.

[0015]This device uses the ink jet recording method which breathes out and records ink from said recording head. That is, this recording head is provided with the energy generation means which generates the drop formation energy made to act on the fluid in the energy action part established in a detailed liquid discharge port (orifice), a liquid route, and a part of this liquid route, and this action part.

[0016]A record method using electric machine conversion bodies, such as a piezo-electric element, as an energy generation means which generates such energy, irradiate with electromagnetic waves, such as laser, they are made to generate heat, and the record method using the energy generation means which heats a fluid and makes a fluid breathe out with electric thermal-conversion objects, such as a heater element which has a record method using the energy generation means which makes a drop breathe out in the operation by this generation of heat, or a heating resistor, etc. come out.

[0017]Since the recording head used

for the ink jet recording method which makes a fluid breathe out with thermal energy also in it can arrange the liquid discharge port (orifice) for breathing out the drop for record and forming the drop for regurgitation with high density, it can record high resolution. The recording head which used the electric thermal-conversion object as an energy generation means also in it, Miniaturization is also easy, and the progress of art and the improvement in reliability in the latest semiconductor field can utilize the strong point of remarkable IC art or micro processing technology more than enough, high-density-assembly-izing is easy, and it is advantageous from a manufacturing cost being cheap.

[0018]The bail roller 9 is allocated in the front upper part (upper left side of drawing 1) of said platen 3, and by the unillustrated driving source, this bail roller 9 is constituted by the platen 3 so that pressure welding (real line position of drawing 1) or alienation (dashed line position of drawing 1) is possible. In order to prevent the dirt in ink etc., the star-shaped-shaped thing of said bail roller 9 is desirable. The 2nd guide plate 10 and the 3rd guide plate 11 are allocated in said bail roller 9 upper part, and it is constituted so that the recording medium 6 after the 2nd path may pass through between said guide plates 10 and 11.

[0019]On the other hand, the axis of rotation 13 of the 1st discharge roller 12 is allocated the neighborhood [on the near side (right-hand side of drawing 1) of the 3rd guide plate 11, and the common tangent which passes along the welding by pressure by pressure point of this bail roller 9 and the platen 3 at the time of pressure welding to the platen 3 of the bail roller 9 if it puts in another way]. Said 1st discharge roller 12 is being fixed to said axis of rotation 13, and said axis of rotation 13 is connected with said platen shaft 2 by the unillustrated gear, the belt, the friction roller, etc.

[0020]As shown in drawing 2 in detail, two or more tooth parts 14 are formed in the 1 side-edge side of the 1st

discharge roller 12 every constant interval at the circumferencial direction, after the rear end part of the recording medium 6 has inserted between this tooth part 14 and 14, it is raised, and it is constituted so that definite angle rotation may be carried out. The follower roller 15 furthermore supported by the peripheral face of the 1st discharge roller 12 enabling free rotation on the axis 16 is welding by pressure, and said follower roller 15 is constituted so that it may follow and rotate to rotation of the 1st discharge roller 12. Although said follower roller 15 is not illustrated, it may be a star-shaped-shaped spur roller.

[0021]The 2nd discharge roller 17 of business is arranged at the upper part side of said 2nd guide plate 10 and the 3rd guide plate 11 at the time of the 2nd path, and this 2nd discharge roller 17 is being fixed to the axis of rotation 18. Said axis of rotation 18 is connected with the platen shaft 2 by the unillustrated gear, the belt, the friction roller, etc.

[0022]Two or more tooth parts 19 are formed in the 1 side-edge side of the 2nd discharge roller 17 as well as said 1st discharge roller 12 every constant interval at the circumferencial direction. The bearing 18a is fitted in the axis of rotation 18 of said 2nd discharge roller 17, and the periphery of said bearing 18a is equipped with the paper tray 20, enabling free rotation. Said paper tray 20 is for loading the recording medium 6 after the 2nd path, and has prevented **** to a near side with the stopper 21. The follower roller 22 supported by the axis 23 in the peripheral face of said 2nd discharge roller 17 as well as said 1st discharge roller 12 enabling free rotation is welding by pressure, and said follower roller 22 is constituted so that it may follow and rotate to rotation of the 2nd discharge roller 17. It presses down on said axis 23, it is equipped with the board 24, enabling free rotation, and **** of the recording medium 6 loaded into said paper tray 20 with this presser-foot board 24 is prevented. The recording medium 6 falls, and 25 is a preventive plate and

is attached to the upper surface of the printer body 1.

[0023]Next, an operation of the printer constituted as mentioned above is explained with reference to drawing 1 - drawing 6.

[0024]As first shown in drawing 1, at the time of the 1st path, the recording medium 6 is set so that the surface 6a may turn into a recording surface. When carrying out the insertion set of the recording medium 6, it is made for the career 8 to be located in the cross direction center of a recording medium, and is made to send in along with the 1st guide plate 7. The bail roller 9 is changed into the state (real line position of drawing 1) where it was welded by pressure to the platen 3 by the constant pressure, at this time. And if the platen 3 is rotated, as shown in drawing 3, the tip part of the recording medium 6 will be led to the plane of composition of the platen 3 and the bail roller 9, and record of a picture will be performed by the unillustrated recording head.

[0025]After record, said recording medium 6 is discharged by the tangential direction of the platen 3 and the bail roller 9, and is led to the spot weld of the 1st discharge roller 12 and the follower roller 15. And as shown in drawing 4, it inserts between the tooth parts 14 and 14 of the 1st discharge roller 12, definite angle rotation is raised and carried out by rotation of the 1st discharge roller 12, and the rear end part of the recording medium 6 is led to the loading slot of a recording medium, as shown in drawing 5. At this time, said recording medium 6 will be in the state where it was set so that that rear face 6b might turn into a recording surface.

[0026]Next, at the time of the 2nd path, beforehand, the bail roller 9 is missed from the dashed line position on the platen 3 to the real line position, as shown in drawing 5. Therefore, since the bail roller 9 is in the state where it was estranged from the platen 3, beforehand at the time of this 2nd path, The tip part of the recording medium 6 reaches the spot weld of the

2nd discharge roller 17 for the 2nd path, and the follower roller 22 through the passage which comprises the 2nd guide plate 10 and the 3rd guide plate 11 as shown in drawing 6, after passing through between the platen 3 and the 1st guide plate 7. And after having been regulated by said presser-foot board 24, it is pushed into the paper tray 20, and finally the rear end part of the recording medium 6 is raised by the tooth part 19 of the 2nd discharge roller 17, and after this spot weld passage is loaded into the paper tray 20. Record is performed at the rear face 6b of the recording medium 6 at the time of the 2nd path.

[0027]Next, the control and its operation at the time of the double-sided recording in the printer of said composition are explained with reference to drawing 7 and drawing 8.

[0028]Drawing 7 is a block diagram showing the electric circuit of said printer. In drawing 7, the address bus from CPU(central processing unit) 701, a data bus, And the bus 711 which consists of a control signal which controls them is outputted, the bus 710 -- ROM702, RAM703, the data receiving section 704, and ink -- it is crowded among them and, in home position detection, the Duty judging means 705, the print mode selecting means 706, the recording head movement driving part 707, the recording-medium conveyance actuator 708, the recording head record actuator 709, and a recording head. And it is connected to the sensor part 710 which performs existence detection of a recording medium, etc.

[0029]Said CPU701 is controlled by the program built in ROM702. The recorded information transmitted from the host computer is received by the data receiving section 704 by the side of a printer. The data receiving section 704 delivers and receives data according to the state of a printer, and received data are stored in RAM703. CPU701 controls the recording head movement driving part 707, the recording-medium conveyance actuator 708, and the recording head

record actuator 709 by the recording instruction from a host computer, respectively.

[0030]Drawing 8 is a flow chart which shows the control action of said printer. In drawing 8, if a power supply is supplied to a printer (Step 801) and record data is received from a host computer (Step 802), a printer inhales a recording medium (Step 803) and stores the record data for one line in RAM703. And record of one line is performed by 1 line-buffer full or the recording instruction from a host computer (Step 804). Said operation is repeated and it records one by one for every line (Step 805).

[0031]After the record for 1 page (surface recording) is completed in Step 805, it progresses to Step 806 and discharge of a recording medium is performed. Here, when said recording operation is one side record, it progresses to Step 807, and it is discharged on a paper tray, and when it is double-sided recording, said recording medium progresses to Step 808, and is set to the suction position (loading slot side of a recording medium) of rear-face record. If said recording medium is set to the suction position of rear-face record, it progresses to Step 803, a recording medium is inhaled and subsequently to Step 804 it progresses, and below, like operation of surface recording, from a host computer, record data will be received and it will record for every line. If the end of 1-page record is carried out, a recording medium will be discharged and surface recording and rear-face record will be completed.

[0032]Drawing 9 is a section composition explanatory view of the printer which is one example of the ink-jet recording device concerning this invention.

[0033]In the figure, it is a case of a printer, and the ink jet nozzle whose ink tank 902 were united 901 and was united 903, respectively, and is provided in the both sides by the side of the surface of the print sheet conveyed, and a rear face. The guide roller for paper support and 906 show a sheet feeding device, 907 shows a

delivery device, and 904 and 905 show the printing object medium 908. 911 is a computer.

[0034]In this example, the ink jet nozzles 902 and 903 arranged inside the case 901 at the both-sides side of a paper exist. It can print simultaneously to both sides of a paper by the nozzle of an ink tank integral type arranged under besides.

[0035]In the printer, it has the computer department 911 which has a memory for editing and processing print data by a larger printer buffer and inside than the usual printer.

[0036]In this computer department 911, print data are taken out from a memory, and it has in it a means which controls and carries out double-side printing of said ink jet nozzle using this.

[0037]Next, operation of this example is explained using the flows of control shown in drawing 10.

[0038]First, the print data sent from the computer etc. are read into the computer department 911 in a printer at Step 1001, and perform the judgment of double-side printing and single side printing.

[0039]Next, carry out the judging means of Step 1002 and in the case of double-side printing, The data taken out from the memory at Step 1003, distributing to the surface of a paper, and a rear face. Operation of picking out the paper suitable for a form from a paper cassette, feeding paper at Step 1004, printing on the surface by the ink jet nozzle 902, and printing at the rear face by the ink jet nozzle 903 is performed one by one at Step 1005.

[0040]The printed paper is discharged by 905 and 907 to the case exterior. In the case of single side printing, Step 1007 performs the usual printing.

[0041]Drawing 11 and 12 are the examples intelligibly illustrated about the problem which this suggestion is going to solve.

[0042]Drawing 11 shows here the print data printed to a rear face in the print data printed to the surface of a printing object medium by drawing 12.

[0043]1101, the object by which 1201

is constituted from image data, and 1102, 1103 and 1202 show the object which comprises text data. If image data is generally printed, since it will be set to high Duty, when all of 1101, 1102, 1103, 1201, and 1202 are printed by the same print mode, while [1103 / 1102 and] adjoining with the surface and the rear face, the mixed colors of back projection and ink tend to occur. In 1103 and 1202 which adjoin with the surface and the rear face in a similar manner on the other hand, since both are text data and are low Dut (ies), it is hard to generate the mixed colors of back projection and ink.

[0044]It is low Duty about 1102 and 1201 eventually by the means described below in this example device, Printing which does not have mixed colors of back projection and ink in an image data part by printing 1102, 1103, and 1202 by high Duty, In a text data part, there are no mixed colors of back projection and ink, and clear printing is realized and it is said that it is suitable and the output of the top quality will be obtained by every portion of the whole printing picture rather than further based on high Duty printing.

[0045]the ink of the both sides whose drawing 13 is the feature of this implementation device -- it is the flow chart described about a means to acquire the information for being crowded among them and judging whether Duty is excessive to a printing object medium.

[0046]At Step 1301, 0 is put in and initialized to the variable Z which shows the rear surface of a printing object medium. Explanation is advanced as that as which Z= 0 means the surface of a printing object medium, and Z= 1 means the rear face of a printing object medium hereafter.

[0047]setting the field consecutive numbers to X and Y shaft orientations to Y for the field consecutive numbers to an X axial direction when dividing a printing object medium top in arbitrary area units in Step 1302 -- this -- X -- this -- Y is initialized. In this figure, explanation is advanced like drawing 11 and the example of 12 supposing

the case where 20 division and Y shaft orientations are divided into 40 for an X axial direction.

[0048]In Step 1303, it is judged whether an object exists on a field (X, Y, Z). In existing here and not existing to Step 1304, it progresses to Step 1307.

[0049]In Step 1304, the number of the object which exists on a field (X, Y, Z) is recorded. For example, in drawing 11, since the object which exists in a field (2, 4, 0) is 1101, it is set to Data [2, 4, 0].ObjectNO=1101.

[0050]In Step 1305, the image area separation which is known art performs the attribute judging of the object on this field. Image area separation is the art in which a character line (following text data) judges whether it is a photograph (following image data) for every field of a picture in the picture included to the field here, It is put in practical use in the combination etc. of the application software which moves on Windows (R) of Microsoft Corp. which is today's typical OS, and this OS, and a driver. As a result of this judgment, when judged with it being text data in Step 1306 when judged with this object being image data, it progresses to Step 1308.

[0051]In Step 1306, the attribute value DEEP which shows that it is high Duty is recorded on arrangement Data[X, Y, Z].Attrib which shows Duty of the print data on this field (X, Y, Z). That is, in this example device, if it is image data, unique matching by it being high Duty will be performed.

[0052]In Step 1309, X is **************ed, if this upper limit has not been reached yet at Step 1310 as compared with the upper limit 20 of the counter of a field, it processes again by returning to Step 1303, otherwise it progresses to Step 1311.

[0053]At Step 1311, X is initialized and Y is **************ed, if this upper limit has not been reached yet at Step 1312 as compared with the upper limit 40 of the counter of a field, it returns to Step 1303 and processes again, otherwise it progresses to Step 1313.

[0054]At Step 1313, Y is initialized, Z is **************ed and processing is shifted to the rear face of a printing object medium. In Step 1314, comparison with the upper limit 2 of Z is performed, if it does not amount to 2 yet, in order to process a rear face, it progresses to Step 1302, and since it turns out that processing on the back is completed when amounting to 2, processing is ended at Step 1315.

[0055]When it is considered at Step 1303 that an object does not exist on a field (X, Y, Z) and it progresses to Step 1307, on this field, value-1 which shows that there are no print data is substituted for Data[X, Y, Z]. ObjectNO, and it progresses to Step 1308.

[0056]Step 1308 is carried out, when judged with the object on this field being text data at Step 1305, and when there is no object and Step 1307 is performed on this field. At Step 1308, the attribute value LIGHT which shows that it is low Duty is recorded on arrangement Data[X, Y, Z].Attrib which shows Duty of the print data on this field (X, Y, Z) here. That is, in this example device, if it is text data, unique matching by it being low Duty will be performed.

[0057]Drawing 14 is the flow chart described about a means to choose automatically the print mode which was most suitable for the situation from two or more print modes which are the features of this example device.

[0058]Initialization of X, Y, and Z is performed at Step 1401. Since each contents of X, Y, and Z are the same as the variable of the same name in drawing 13, explanation is omitted.

[0059]In Step 1402, the print mode which can be determined for every object is initialized. The arrangement PrintMode [number of an object] is arrangement which stores the print mode corresponding to each object, and PrintMode [Data[X, Y, Z]. ObjectNO] shows the print mode of the print data on a field (X, Y, Z). Here, MODE2 is put in and initialized to this print mode. By an embodiment, various assignment is possible for the real contents of MODE2, and they are

explained henceforth [drawing 15] about the details of this assignment.

[0060]Steps 1403, 1404, 1405, 1406, 1407, and 1408 are general loop processings, and can initialize the print mode of all the objects on a printing object medium by MODE2 by carrying these out.

[0061]In Step 1409, initialization of X and Y is performed again.

[0062]In Step 1410, it judges whether Duty of the print data of a field (X, Y, 0), i.e., a surface object domain, is DEEP, if it is DEEP, it will pass step 1411, otherwise it progresses to 1414.

[0063]In Step 1411, it judges whether Duty of the print data of a field (X, Y, 1), i.e., an object domain on the back, is DEEP, if it is DEEP, it will pass step 1412, otherwise it progresses to Step 1414.

[0064]When both Dut(ies) of the surface and a rear face are high, the print mode information on an applicable object is rewritten to MODE1 by Step 1412 and Step 1413. By an embodiment, various assignment is possible for the real contents of MODE1, and they are explained henceforth [drawing 15] about the details of this assignment.

[0065]Steps 1414, 1415, 1416, and 1417 are general loop processings, and can assign the optimal print mode to all the objects on a printing object medium by carrying these out.

[0066]An end of all the processings will end processing at Step 1418.

[0067]Drawing 15 is the flow chart which described the feature of this example device most directly.

[0068]If a printing job is started at Step 1501, the print mode corresponding to each object will be assigned at Step 1502 by the means described by drawing 13 and drawing 14.

[0069]In Step 1503, "the printing means of low Duty" is adopted to MODE1.

[0070]In Step 1504, "the printing means of the quantity Duty" is adopted to MODE2.

[0071]In Step 1505, the mechanism mechanism and operation of the

double-side printing which made reference by setting out which prints each object by the print mode called for by the processing performed above at drawing 1 - drawing 10 are exercised.

[0072]As a means to realize the printing means of high Duty expressed here, and two or more printing means by which the printing means of low Duty was classified, the following publicly known art is employable.

[0073]For example, the ink quantity breathed out from a recording head can be controlled, and the printing means of high Duty and the case where it is few can be adopted for the case where there is much discharge quantity, as a printing means of low Duty.

[0074]It can constitute so that it may have deep ink (following, thick ink) and thin ink (henceforth, thin ink) to each colors of each, and the time of the printing means of high Duty and thin ink use can be adopted for the time of thick ink use as a printing means of low Duty.

[0075]The printing means of high Duty and the case where it thins out and prints are [the case where it prints without providing and thinning out what is called an infanticide printing means that prints by opening a dot space] employable as a printing means of low Duty.

[0076]By choosing the print mode of low Duty, when the object of an image adjoins on both sides, as stated above, and choosing the print mode of high Duty, in being other. In the print-data part of high Duty, clear printing is realized, by every portion of the whole printing picture, it is suitable and the output of the top quality is obtained rather than there are no mixed colors of back projection and ink in the print-data part of low Duty about printing without the mixed colors of back projection and ink.

[0077](Example 2) Since the fundamental composition of this example device is the same as that of the example device 1, it is omitted, and it explains only composition peculiar to this example device.

[0078]Drawing 16 is the flow chart

which described the feature of this example device most directly.

[0079]If a printing job is started at Step 1601, the print mode corresponding to each object will be assigned at Step 1602 by the means described by drawing 13 and drawing 14.

[0080]In Step 1603, "the printing means which uses colorless ink" is adopted to MODE1.

[0081]In Step 1604, "the printing means which does not use colorless ink" is adopted to MODE2.

[0082]Colorless ink means the colorless print disposition top treating solution here.

[0083]On the characteristic of being a fluid, after contacting object print media, this colored ink will react to this treating solution promptly, and common colored ink will insolubilize it, if the regurgitation of this colored ink is carried out to the same pixel on a medium after breathing out previously the print disposition top treating solution of this colorlessness in space, although it permeates to the back of the textiles of paper. Since the insolubilized this color material does not enter to the back of paper, many color materials remain in the surface and back projection is reduced. Since the chemical composition of this treating solution is publicly known, it omits explanation here.

[0084]In Step 1605, the mechanism mechanism and operation of the double-side printing which made reference by setting out which prints each object by the print mode called for by the processing performed above at drawing 1 - drawing 10 are exercised.

[0085]By choosing the print mode which uses colorless ink, when the object of an image adjoins on both sides, as stated above. Printing without the mixed colors of back projection and ink is realized saving printing which reduces osmosis of the colored ink to a medium and does not have mixed colors of back projection and ink without using colored ink in a text data part, by every portion of the whole printing picture, it is suitable

and the output of the top quality is obtained.

[0086](Example 3) Since the fundamental composition of this example device is the same as that of the example device 1, it is omitted, and it explains only composition peculiar to this example device.

[0087]Drawing 17 is the flow chart which described the feature of this example device most directly.

[0088]If a printing job is started at Step 1701, the print mode corresponding to each object will be assigned at Step 1702 by the means described by drawing 13 and drawing 14.

[0089]In Step 1703, it judges whether the thing of print mode =MODE1 is in all the objects of a rear surface, and if it exists and does not exist to Step 1705, it progresses to Step 1704.

[0090]Double-side printing is performed in Step 1704.

[0091]In Step 1705, single side printing of surface print data and the print data on the back is carried out to a respectively different printing object medium, without performing double-side printing.

[0092]Printing which chooses single side printing and does not have mixed colors of back projection and ink when the object of an image adjoins on both sides, as stated above, Though double-side printing is performed when that is not right, printing without the mixed colors of back projection and ink is realized, and the suitable output which filled the demand of each portion of the whole printing picture is obtained.

[0093](Example 4) Since the fundamental composition of this example device is the same as that of the example device 1, it is omitted, and it explains only composition peculiar to this example device.

[0094]the ink of the both sides whose drawing 18 is the feature of this example device -- it is the flow chart described about a means to acquire the information for being crowded among them and judging whether Duty is excessive to a printing object medium.

[0095]At Step 1801, 0 is put in and

initialized to the variable Z which shows the rear surface of a printing object medium. Explanation is advanced as that as which Z= 0 means the surface of a printing object medium, and Z= 1 means the rear face of a printing object medium hereafter.

[0096]setting the field consecutive numbers to X and Y shaft orientations to Y for the field consecutive numbers to an X axial direction when dividing a printing object medium top in arbitrary area units in Step 1802 -- this -- X -- this -- Y is initialized. In this figure, explanation is advanced like drawing 11 and the example of 12 supposing the case where 20 division and Y shaft orientations are divided into 40 for an X axial direction.

[0097]In Step 1803, it is judged whether an object exists on a field (X, Y, Z). In existing here and not existing to Step 1804, it progresses to Step 1806.

[0098]In Step 1804, the number of the object which exists on a field (X, Y, Z) is recorded. For example, in drawing 11, since the object which exists in a field (2, 4, 0) is 1101, it is set to Data [2, 4, 0].ObjectNO=1101.

[0099]The total dot number of the print data in a concerned area is computed, and it substitutes for Step 1805 at arrangement Data[X, Y, Z]. Duty which shows Duty of the print data on this field (X, Y, Z).

[0100]In Step 1808, X is **************ed, if this upper limit has not been reached yet at Step 1809 as compared with the upper limit 20 of the counter of a field, it processes again by returning to Step 1803, otherwise it progresses to Step 1810.

[0101]At Step 1810, X is initialized and Y is **************ed, if this upper limit has not been reached yet at Step 1811 as compared with the upper limit 40 of the counter of a field, it returns to Step 1803 and processes again, otherwise it progresses to Step 1812.

[0102]At Step 1812, Y is initialized, Z is **************ed and processing is shifted to the rear face of a printing object medium. In Step 1813,

comparison with the upper limit 2 of Z is performed, if it does not amount to 2 yet, in order to process a rear face, it progresses to Step 1802, and since it turns out that processing on the back is completed when amounting to 2, processing is ended at Step 1814.

[0103]When it is considered at Step 1803 that an object does not exist on a field (X, Y, Z) and it progresses to Step 1806, on this field, value-1 which shows that there are no print data is substituted for Data[X, Y, Z].ObjectNO, and it progresses to Step 1807.

[0104]Zero is substituted for Step 1807 at arrangement Data[X, Y, Z].Duty which shows Duty of the print data on this field (X, Y, Z).

[0105]Drawing 19 is the flow chart described about a means to choose automatically the print mode which was most suitable for the situation from two or more print modes which are the features of this example device.

[0106]Initialization of X, Y, and Z is performed at Step 1901. Since each contents of X, Y, and Z are the same as the variable of the same name in drawing 18, explanation is omitted.

[0107]In Step 1902, the print mode which can be determined for every object is initialized. The arrangement PrintMode [number of an object] is arrangement which stores the print mode corresponding to each object, and PrintMode [Data[X, Y, Z].ObjectNO] shows the print mode of the print data on a field (X, Y, Z). Here, MODE2 is put in and initialized to this print mode. By an embodiment, various assignment is possible for the real contents of MODE2, and they can apply respectively drawing 15 in the example device 1, drawing 16 in the example device 2, drawing 17 in the example device 3, etc. about the details of this assignment.

[0108]Steps 1903, 1904, 1905, 1906, 1907, and 1908 are general loop processings, and can initialize the print mode of all the objects on a printing object medium by MODE2 by carrying these out.

[0109]In Step 1909, initialization of X

and Y is performed again.

[0110]In Step 1910, Duty of the print data of the surface of a field $(X, Y, 0)$, i.e., an object domain, and Duty of the print data of the rear face of a field $(X, Y, 1)$, i.e., an object domain, are added, and comparison with the boundary value DEEP defined beforehand is performed. When judged with this aggregate value being larger than DEEP, and being high Duty, it passes step 1911, otherwise it progresses to 1912.

[0111]When the value adding Duty of the surface and a rear face is high, the print mode information on an applicable object is rewritten to MODE1 by Step 1911 and Step 1912. By an embodiment, various assignment is possible for the real contents of MODE1, and they can apply respectively drawing 15 in the example device 1, drawing 16 in the example device 2, drawing 17 in the example device 3, etc. about the details of this assignment.

[0112]Steps 1913, 1914, 1915, and 1916 are general loop processings, and can assign the optimal print mode to all the objects on a printing object medium by carrying these out.

[0113]An end of all the processings will end processing at Step 1917.

[0114]If the allocation means of the print mode shown by drawing 15 in the judging means and the example device 1 of a print mode which have been described above is used together, By choosing the print mode of low Duty, when superfluous high Duty is detected with the aggregate value of the dot counts of an ink drop wrong side out, and choosing the print mode of high Duty, in being other, by every portion of the whole printing picture, it is suitable and the output of the top quality is obtained.

[0115]If the allocation means of the print mode shown by drawing 16 in the judging means and the example device 2 of a print mode which have been described above is used together, By choosing the print mode which uses colorless ink, when superfluous high Duty is detected with the aggregate

value of the dot counts of an ink drop wrong side out. Printing without the mixed colors of back projection and ink is realized saving printing which reduces osmosis of the colored ink to a medium and does not have mixed colors of back projection and ink, in being other without using colored ink, by every portion of the whole printing picture, it is suitable and the output of the top quality is obtained.

[0116]If the allocation means of the print mode shown by drawing 17 in the judging means and the example device 3 of a print mode which have been described above is used together, Printing which chooses single side printing and does not have mixed colors of back projection and ink when superfluous high Duty is detected with the aggregate value of the dot counts of an ink drop wrong side out, Though double-side printing is performed when that is not right, printing without the mixed colors of back projection and ink is realized, and the suitable output which filled the demand of each portion of the whole printing picture is obtained.

[0117]

[Effect of the Invention]By the above composition, it can become possible to choose the optimal print mode automatically for every object print data, the performance of an ink-jet recording device with a perfecting machine style can be pulled out efficiently, and facilities can be given to a user.

[Translation done.]